



DIABETES

www.kdhe.state.ks.us/c-f/special_needs_part2.html

We also recommend you review:

http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf



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Diabetes

I. Definition

Diabetes is a chronic condition in which the body is unable to use carbohydrates because of inadequate production of insulin or inadequate use of insulin. This inadequacy results in excessive amounts of glucose (sugar) in the student's blood and urine, which is called hyperglycemia.

Insulin is a hormone produced by the pancreas, a gland near the stomach. Insulin is used by the body to regulate carbohydrate metabolism. Normally the body stores glucose in the liver and muscles or changes it into fat. Only a small amount of glucose remains in the blood. When there is too little insulin, the body is unable to store the glucose normally. Therefore, the glucose stays in the blood and the blood glucose level rises. As the blood glucose rises, some of the glucose leaves the body through the urine. Glucose can be measured in the urine and the blood.

Diabetes can be classified as Type 1 or Type 2. Type 1 usually begins during childhood or adolescence, while Type 2 usually begins in adulthood. Type 2 diabetes will not be discussed because it is typically seen with adults, but is becoming more common in children and adolescents. A student with Type 1 diabetes produces too little or no insulin. Type 1 individuals with diabetes require an outside source of insulin to help control the glucose in their bodies. Students with Type 1 diabetes can have either hypoglycemia (low blood glucose) or hyperglycemia (high blood glucose). Type 1 diabetes is the focus of this section.

II. Management

Management of diabetes involves watching for signs of hypoglycemia or hyperglycemia, monitoring blood glucose, and treating hypoglycemia or hyperglycemia as indicated. It is important to maintain a balance to prevent hyperglycemia or hypoglycemia. Maintaining blood glucose levels in as near normal range as possible will prevent and/or delay the development of complications of diabetes as noted by the 10 year Diabetes Control and Complications Trial.

A. Hyperglycemia/Ketoacidosis

High blood sugar levels (hyperglycemia) are important to identify and treat. The term hyperglycemia is used when sugar in the bloodstream is too high (usually above 160-180 mg/dl). If left untreated over a period of days or weeks a more serious condition, Ketoacidosis can occur. Furthermore excessively prolonged high blood sugar levels can result in loss of consciousness, although this is rare.

Causes of hyperglycemia include:

- Too much food
- Lack of exercise

- Lack of or emission of insulin
- Stress or illness
- "Rebound" effect from low blood sugar.

B. Hypoglycemia

Detection of low blood sugar (hypoglycemia) is essential to effective treatment of diabetes. The term hypoglycemia is used when sugar in the blood stream falls below normal (usually below 70 mg/dl). Low blood sugar can cause loss of consciousness, seizures and if left untreated death may ensue.

Causes of hypoglycemia include:

- Not enough food or a delayed meal
- Too much exercise
- Too large a dose of insulin
- Alcohol and other drugs
- Stress or illness

Hypoglycemic reactions most frequently occur:

- Just before meals or snacks
- After strenuous exercise

C. Signs of Hypoglycemia and Hyperglycemia

The following table summarizes the observable signs/symptoms of hypoglycemia and hyperglycemia to watch for in the diabetic student.

Hypoglycemia (Low blood glucose)	Hyperglycemia (high blood glucose)
pale, cool, moist skin	dry, warm, flushed skin
becomes shaky, nervous, and/or unable to concentrate	becomes lethargic (symptoms under hypoglycemia do not occur)
thirst and urination do not increase	thirst and urination increase
symptoms worsen within minutes	symptoms usually take days or weeks to progress
administration of sugar resolves symptoms	administration of sugar will increase thirst and urination
headache, irritability, pounding heart, changes in vision, hunger, restlessness, tiredness, combativeness, poor coordination, convulsions	hunger, fruity breath odor, weight loss, nausea, changes in vision, vomiting, Ketouria

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D. Hypoglycemia and Hyperglycemia

When hypoglycemia or hyperglycemia are identified by observations, urine glucose testing, or blood glucose testing, refer to the following sections for sample procedures on treatment of hypoglycemia and hyperglycemia. Additionally, if blood glucose results are available, refer to blood sugar algorithms which summarize treatment indicated for a student with specific blood glucose levels. If extreme hypoglycemia (a medical emergency) occurs, refer to the glucagon injection procedure along with the hypoglycemia procedure for guidelines on management.

These procedures are only guidelines and should accompany a child-specific Individualized Health Care Plan. The student Individualized Health Care Plan should include detailed written orders on how to monitor the student with diabetes and how to treat hypoglycemia and hyperglycemia in the individual diabetic student.

E. Monitoring for Blood Urine Glucose

Before a student demonstrates symptoms of hypoglycemia and hyperglycemia, evidence of hypoglycemia and hyperglycemia can be detected in the student's urine and blood. The student's blood and urine can be monitored/tested to determine the amount of glucose present. Blood testing is the preferred method for testing glucose.

Urine glucose testing has limitations and is not recommended by the American Diabetic Association. Glucose in the urine does not rise until the blood glucose is over 150-180 milligrams per deciliter (mg/dl). Additionally, there is a lag time of twenty minutes to two hours between the time the blood glucose rises and the glucose rises in the urine. However, despite the limitations, urine testing may still be used with some students, although it is of no use when addressing hypoglycemia. To test for urine glucose follow the directions on the container of strips for measuring urine glucose. Most glucose monitoring strips can not be touched with the finger. Most tests are now done in less than 60 seconds and few require blotting. After testing, the results should be recorded on the student's health record.

Blood Glucose testing is being taught to young students and lawful custodians as a method of optimal glucose control. Glucose is monitored at prescribed times (fasting, before meals, and one to two hours after meals). Based on the glucose value obtained, treatment is prescribed by the physician.

To test for blood glucose, follow the directions which come with the student's blood glucose monitor. If directions are unavailable, see the sample procedure for blood glucose testing.

Note: It is important to note that most students with diabetes do their own glucose
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testing and insulin administration. (Please refer to the self-administration of medication guidelines under Medication Guidelines, Section D, page 4).

III. Special Equipment

A sugar source should be kept at school, and the student should also carry a source of sugar. A diabetes emergency kit is recommended. Place the contents in a lunch pail or plastic container, and label it with the student's name, the contents, and "Diabetes Emergency Kit" (see p 6). Additional equipment might include blood or urine testing equipment as well as insulin administration supplies.

IV. Suggested Setting

The identification of hyperglycemia or hypoglycemia should occur in the health office. This provides privacy and a central area for maintenance of equipment and supplies. However, hyperglycemia or hypoglycemia may occur on the school playground, on a field trip or in other areas a considerable distance away from the health office. Procedures on the student's "Anticipated Health Crises" plan (attached to Individualized Health Care Plan) and appropriate equipment should always be immediately available and accessible when the student is not in close proximity to the school health room.

V. Suggested Personnel & Training

A registered nurse can train unlicensed school personnel about the symptoms of hyperglycemia or hypoglycemia and the appropriate procedures for determining low blood sugar levels. Designated unlicensed school personnel must function under the supervision of the nurse.

VI. Individualized Health Care Plan: Issues for Special Consideration

Identification and intervention for hyperglycemia or hypoglycemia requires a physician's authorization. The service must be reauthorized yearly by the prescribing physician and lawful custodian.

Communication should be maintained between the school nurse and lawful custodians of students with diabetes to determine the current condition and regimen for treatment.

Hyperglycemia or hypoglycemia (insulin reactions) should be treated according to the Individualized Health Care Plan and the accompanying Anticipated Health Crisis Plan. A sample Individualized Health Care Plan and Anticipated Health Crisis Plan are found in Appendix A. These may be copied and used to develop a plan for each student.¹

Diabetes Emergency Kit

A diabetes emergency kit should be kept in a place known by the student with diabetes and by any school staff member who may be treating hypoglycemia (low blood sugar). If a student leaves campus (for example, to go on a field trip), the kit should be taken along. Place the contents in a lunch pail or plastic container. The label should state, "Diabetes Emergency Kit," and should include the student's name.

The contents of the kit should include:

1. **A 5 by 7 inch (13 by 18 cm) card with a brief history of the student's diabetes**
2. **Sugar: 3 teaspoons (14 gm), five small cubes, or three packets**
3. **Honey: 3 teaspoons (10 ml)**
4. **Apple or orange juice: two 6 ounce (180 ml) cans**
5. **A sugar-containing soda (preferably clear or lemon-lime soda) 4 oz.**
6. **Vanilla frosting in a tube (10 grams) or instant glucose (25 to 30 gm tube)**
7. **A snack pack of cheese and crackers**
8. **A copy of information on Hypoglycemia," pp's 2-3**

Other items that may be added to the kit on request from the lawful custodian and physician include:

1. **Equipment for testing blood and urine (Include a copy of "Blood Glucose Testing") pp's 7-10.**
2. **Glucagon kit or injection kit (Include a copy of "Glucagon Injection") pp's 20-23.**

Blood Glucose Testing

I. Purpose

Blood glucose testing determines the glucose (sugar) level in the bloodstream. The results are measured in milligrams per deciliter (mg/dl).

The purpose of blood glucose testing is to determine the level of blood sugar at designated testing times or when symptoms of hypoglycemia or hyperglycemia occur (Refer to the procedures under "Diabetes: Hypoglycemia" and "Diabetes: Hyperglycemia.")

Blood glucose testing should be an automatic part of treatment for hypoglycemia or hyperglycemia and this procedure requires a physician's authorization. The service must be reauthorized yearly by the prescribing physician and lawful custodian.

II. Suggested Settings

The identification of hypoglycemia should occur in the health office. This provides privacy and a central area for maintenance of equipment and supplies. However, hyperglycemia/hypoglycemia may occur on the school playground, on a field trip or in other areas a considerable distance away from the health office. Procedures on the students "Anticipated Health Crises" plan (attached to Individualized Health Care Plan) and appropriate equipment should always be immediately available and accessible when the student is not in close proximity to the school health room.

III. Special Equipment

- Alcohol prep pad (optional)
- Device to prick finger (Lancet,™ Autolet,™ Autolancet,™ Penlet,™ etc.)
- Blood testing strip (Chemstrips,™ Glucostix,™ Glucoscan strips,™ etc.)
- Kleenex, cotton ball, or specific blotting material to wipe or absorb blood from the testing strip and to stop bleeding of the finger
- Latex gloves
- Log system (school health log/student logbook if requested)
- Watch or clock with a second hand
- Blood testing meter, such as Accucheck,™ Glucometer,™ Glucoscan,™ etc.
- Diabetes Emergency Kit (see previous page)

IV. Suggested Personnel and Training

School nurse

Designated school personnel under direct or indirect supervision

School nurse as procedural supervisor

V. Individualized Health Care Plan

Regular monitoring of blood glucose levels contributes toward proper management of diabetes.

A sample of the Individualized Health Care Plan and Anticipated Health Crisis Plan are found in Appendix A. These may be copied and used to develop a plan for each student.

Blood Glucose Testing

Procedure

Points to Remember

1. Wash your hands with soap and water and put on gloves.
 2. Make sure that student's hands are washed with soap and water as well.
 3. Washing with soap and water is sufficient for prepping the site; however, alcohol may be used for further prepping. (The site selected *must be dry* before it is pricked.)
 4. Select a site on the top sides of any fingertip. Hang the arm below the level of the heart for 30 seconds to increase the blood flow; then gently squeeze the fingertip in a milking fashion to increase further the supply of blood to the site.
 5. Puncture the site with the pricking device. Gently squeeze the finger in a downward motion to obtain a large enough drop of blood to cover the test pad on the test strip (1/8 to 1/4 inch { .32 to .64 cm } in diameter). Too much squeezing of the finger gives inaccurate results.
- Alcohol may cause toughening of the skin or a burning sensation. If moisture (water or alcohol) remains on the skin, test results may be altered.*
- The tops of the fingertips may be sensitive. The sides of the fingers have less blood (refer to the picture below).*
- If the pad is not covered or if blood is smeared, the results may be inaccurate.*

6. Touch the drop of blood to the test pad portion of the strip, while the strip is in a level position. Make certain that the blood covers the test pad portion of the strip without smearing.
7. Begin the timing sequence recommended by the manufacturer as soon as blood is placed on the test pad. The next step is to wipe gently or blot the blood off the test strip. Most test strips require 60 seconds before the blood can be wiped or blotted. Again, follow the manufacturer's instructions. (Note: most tests do not require wiping or blotting).

Too much pressure on the pad can lift some of the color.

If a meter is used, follow the instructions in the operating manual that comes with the test meter.
8. Place the pad along the color blocks provided on the container when the timing is complete. The color block that closely matches the color of the pad is the blood glucose value.

Current Meters:
One Touch II, Profile, One Step - less than 45 seconds.
Glucometer Elect - 60 seconds
Precision G - 20 seconds
Accucheck Advantage - 20 to 30 seconds
Accucheck Instant - 12 seconds
9. Record the results on the blood glucose log.
10. Refer to "Algorithms for Blood Sugar Results" on the next page and to the physician's orders to determine which parts of the algorithm are to be followed for management of specific blood sugar levels.

Algorithms for Blood Sugar Results

(To be implemented after the blood sugar level has been obtained)

If the results are below 70 mg/dl

1. Give one fruit exchange (see list).
2. Rest for 15 minutes.
3. Recheck blood sugar, if below 70, repeat steps one and two.
4. May repeat these steps up to three times. If no improvement occurs, call the lawful custodian.
5. After symptoms have been resolved, you must give food to stabilize the blood sugar level.
6. Follow these guidelines for giving food:
 - a. Allow the student to eat a meal or snack early if it is scheduled to be served in one hour or less.
 - b. Give an extra protein exchange and bread exchange if the time for the next meal to be served is greater than one hour (see list).
7. Verbally notify the lawful custodian of a low blood sugar incident.
8. Record the incident.

If the student becomes unconscious

1. Call paramedics.
2. Place the student on his or her side, ensuring drainage of secretions or vomitus should vomiting occur.
3. In cases where glucagon is not available, squeeze instant glucose or vanilla frosting in a tube between the gum and cheek or under the tongue and massage the area.
4. Administer 1 mg glucagon intramuscular (IM). (A physician's order is required as well as an approved procedure). Student may experience nausea and vomiting after administration.
5. Give the student sips of soda to equal 3 to 6 ounces (90 to 180 ml) if he or she awakens and is able to swallow.
6. When consciousness is regained, student may be given one of the exchanges from the following list:

Fruit Exchanges

4 oz. (79 ml) soda
(containing sugar, not
dietic)
4 oz. (79 ml) apple juice
4 oz. (120 ml) orange juice
1/4 cup (60 ml) grape juice
10 grams vanilla frosting in
a tube
10 grams instant glucose
3 teaspoons sugar
3 teaspoons honey
5 small sugar cubes
3 large 1 inch (2.54 cm)
sugar cubes

Protein Exchanges

1 ounce (28g) cheese
2 tablespoons (60 g)
peanut butter
One egg

Bread Exchanges

Six saltines
One long graham cracker
One slice bread

If the results are from 70 to 240 mg/dl

1. **Do not give food. Provide sugar-free fluids.**
2. **Explore other possible causes and follow appropriate protocols if the student is not feeling well.**

If the results are above 240 mg/dl

Check urine for ketones if a kit is available. If a kit is not available, assume Ketones are moderate to large and follow the instructions in section "2" below.

1. If the amount of ketones present in the urine is negligible to small:
 - a. Encourage the student to drink large quantities of sugar-free fluids.
 - b. With a physician's order the school nurse may give insulin to help reduce the blood sugar level.
 - c. Return the student to class.
 - d. Verbally notify the lawful custodian of the incident.
 - e. Record the incident.
2. If ketones are moderate to large:
 - a. Follow the same instructions as in step "1a) and 1b)"
 - b. Repeat blood sugar (and ketones) testing every two hours.
 - c. If insulin is administered with moderate to large ketones, sugar liquids may need to be given.

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- d. Allow students who feel all right to return to class. Continue to check blood sugar and ketones every two hours until blood sugar level is below 240.
- e. Call paramedics immediately if vomiting or other symptoms of ketoacidosis develop (refer to the procedure for hyperglycemia).²

Student's Name: _____

Blood Glucose Testing Skills Checklist

Person Trained: _____

Position: _____

Instructor: _____

	Demo	Return Demonstration					
		Date	Date	Date	Date	Date	Date
A. States name and purpose of procedure.							
B. Preparation:							
2. Completes at ____ o'clock							
3. Identifies where procedure is done (consider privacy & access to bathroom)							
4. Identifies possible problems & appropriate actions							
C. Identifies Supplies:							
2. Clean gloves							
3. Lancet							
4. Blood testing strip							
5. Blood testing meter							
6. Skin prep. and blotting material							
7. Bandaid (optional)							
8. Puncture site using lancet device							
9. Gently squeezes finger in a downward motion & obtains enough blood to cover the test pad on the strip							
10. Avoids squeezing the finger too hard							
11. Holds test strip level & touches drop of blood to it assuring that the test pad is covered with no smearing. Does not touch pad with finger.							
12. Begins recommended timing sequence							
13. Follows manufacturers recommendations for test							
14. Correctly reads (digital) or calibrates (color coded results) on blood testing meter							
15. Records results on blood glucose log							
16. Refers to Blood Sugar Algorithms for any follow-up action that may be required.							
17. Properly disposes of lancets and strips with blood							

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Checklist content reviewed by:

Parent/Lawful Custodian

Date

Insulin Injection

I. Purpose

Insulin is a natural hormone released from the beta cells in the pancreas that promotes sugar metabolism and ultimately decreases circulating glucose/sugar.

The purpose of administering insulin is to reduce the blood sugar level to relieve symptoms of *extreme* hyperglycemia, including lethargy and coma and to prevent extreme consequences of severe hyperglycemia, which could include brain damage or death.

An insulin injection is also given to maintain normal blood sugar levels. Insulin is also given when hyperglycemia occurs and should be administered with a written order as discussed under "Hyperglycemia" on pp's 1-3. Insulin is a natural hormone produced by the body but can cause serious harm if given inappropriately. Since it stimulates the metabolism of sugar, if sugar stores are already depleted an insulin injection could lead to hypoglycemia and death. This procedure requires a physician's authorization and the service must be reauthorized yearly by the prescribing physician and parent/lawful custodian.

Insulin is required to sustain life for the child with Type 1 diabetes. Chronic hyperglycemia is known to lead to the long term complications of diabetes. Most children are treated with two to four insulin injections per day and may require routine pre-lunch insulin to prevent hyperglycemia. Supplemental insulin may be given when hyperglycemia occurs. Insulin should only be administered with a written order from a physician. Hypoglycemia is a potential side effect of insulin administration and should be treated as outlined on pp's 3-4. It would be appropriate to know the child's home insulin schedule to be prepared for the most likely times that hypoglycemia may occur.

II. Suggested Settings

Insulin can be administered in any setting although, if possible, the health office is the location of choice. This allows for student privacy and a cleaner environment. Therefore insulin is prescribed to manage Type 1 diabetes and in cases of hyperglycemia as assessed by blood glucose testing. Observation may be desirable for a short period of time following injection.

III. Special Equipment

- Insulin as prescribed
- Insulin syringes with needles
- Alcohol wipes (if available)

IV. Suggested Personnel and Training

School nurse

Designated school personnel under direct or indirect supervision

School nurse as procedural supervisor

V. Individualized Health Care Plan: Issues for Special Consideration

Regular monitoring of blood glucose levels contributes toward proper management of diabetes.

A sample Individualized Health Care Plan and Anticipated Health Crisis Plan are found in Appendix A. These may be copied and used to develop a plan for each student.

Blood glucose testing should be an automatic part of treatment for hypoglycemia or hyperglycemia and this procedure requires a physician's authorization. The service must be reauthorized yearly by the prescribing physician and lawful custodian.

For a student who requires an insulin injection, the following should receive particular attention:

- Differentiate hypoglycemia from hyperglycemia
- Assess level of consciousness
- Note location of insulin and injection supplies
- Presence and accessibility of an "Anticipated Health Crises Plan"

Insulin Injection

Procedure

Points to Remember

Insulin is based on individual need and ordered by the physician to be given on a sliding scale.

1. Position the student for comfort and assemble equipment.
 - Insulin as ordered
 - Insulin syringes and needles
 - Alcohol swabs
2. Prepare insulin syringe:
 - Remove the needle cover and if necessary the vial cap.
 - Clean rubber diaphragm with alcohol
 - Insert needle into insulin vial
 - Draw up the required amount of insulin
 - Withdraw the needle from the vial
 - Clear syringe of air bubbles and recap.
3. Administer the insulin.
 - Expose and cleanse the injection site (upper, outer area of the thigh, buttock, upper arm or abdomen).

*Injection is given subcutaneously and the sites should be rotated.
Lawful custodian and/or child should provide rotation guide.*
 - Insert needle at a 45 degree angle. Take care not to contaminate the needle or puncture yourself.
 - Inject the insulin by pushing down on the plunger.
 - Withdraw the needle.

4. Observe student for response to injection for up to 20 minutes.
5. Repeat blood glucose testing in 2 hours.
6. Record the procedure on the student health record.⁴

If student shows symptoms of hypoglycemia (see p 2 for symptoms) he/she may be experiencing an insulin reaction. THIS IS A MEDICAL EMERGENCY. A BLOOD GLUCOSE LEVEL SHOULD BE PERFORMED IMMEDIATELY.

Insulin Injection Skills Checklist

Student's Name: _____

Person Trained: _____

Position: _____

Instructor: _____

	Demo Date	Return Demonstration					
		Date	Date	Date	Date	Date	Date
A. States name and purpose of procedure.							
B. Preparation:							
1. Reviews procedure							
2. Position student for comfort							
3. Identifies possible problems & appropriate actions							
C. Identifies Supplies:							
1. Soap and water							
2. Insulin syringe & vial							
3. Alcohol							
4. Sharps container							
D. Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Explains procedure to student & encourages participation if possible							
4. Positions student for comfort							
5. Prepares insulin injection							
6. Cleanses injection site							
7. Administers injection then massages injection site							
8. Safely disposes of needle							
9. Observes and takes necessary action							
10. Documents procedure and problems							

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Checklist content reviewed by:

Parent/Lawful Custodian

Date

Glucagon Injection

I. Purpose

Glucagon is a natural hormone that stimulates the liver to release stored sugar in cases of extreme hypoglycemia.

The purpose of administering glucagon is to raise rapidly the blood sugar level to relieve symptoms of *extreme* hypoglycemia, including unconsciousness and/or seizures and to prevent extreme consequences of severe hypoglycemia, which could include brain damage or death.

A glucagon injection is given when extreme hypoglycemia occurs and should be used along with the procedure under "Diabetes: Hypoglycemia." Glucagon is a natural hormone produced by the body and cannot cause harm if given inappropriately. It stimulates the release of stored sugar in the liver; therefore, if sugar stores are completely depleted, a glucagon injection will not assist in raising the blood sugar level. This procedure requires a physician's authorization and the service must be reauthorized yearly by the prescribing Physician and Lawful Custodian.

II. Suggested Settings

Glucagon can be administered in any setting although, if possible, the health office is the location of choice. This allows for student privacy and a cleaner environment. Also, a cot should be available for a period of recovery.

III. Special Equipment

- An emergency glucagon kit containing a syringe prefilled with diluent and one vial of glucagon powder
- Alcohol wipes (if available)
- Instant glucose or frosting in a tube

IV. Suggested Personnel and Training

School nurse

Designated school personnel under direct or indirect supervision

School nurse as procedural supervisor

V. Individualized Health Care Plan: Issues for Special Consideration

Regular monitoring of blood glucose levels contributes toward proper management of diabetes. A sample Individualized Health Care Plan and Anticipated Health Crisis Plan are found in Appendix A. These may be copied and used to develop a plan for each student.

Blood glucose testing should be an automatic part of treatment for hypoglycemia and this procedure requires a physician's authorization. The service must be reauthorized yearly by the prescribing physician and lawful custodian.

For a student who requires a glucagon injection, the following should receive particular attention:

- Differentiate Hypoglycemia from Hyperglycemia
- Assess level of consciousness
- Note location of glucagon and injection supplies
- Presence and accessibility of an "Anticipated Health Crises Plan" outlining procedure and indications for glucagon injection.

Glucagon Injection

Procedure

Points to Remember

1. Send someone to call the paramedics and then the school nurse and lawful custodian.
2. Place the student on his or her side, ensuring drainage of secretions or vomitus should vomiting occur.
3. Squeeze instant glucose (15 grams recommended) or vanilla frosting in a tube (10 grams) between the gum and cheek or under the tongue, and massage the area to expedite absorption. Not recommended if student is unconscious or seizing. Glucagon, if available, is the substance of choice.
4. Use a glucagon emergency kit and prepare the syringe:
 - Remove the needle cover and vial cap.
 - Inject the entire contents of the syringe into the vial.
 - With the needle remaining in the vial, rotate the vial gently until the solution is clear.
 - Pull back on the plunger to withdraw all the solution into the syringe.

This provides a sugar source in case the glucagon injection is ineffective in releasing sugar stores from the liver.

5. Administer the glucagon.
- Expose and cleanse the injection site (upper, outer area of the thigh, buttock, or upper arm).
 - Hold the syringe like a dart. Take care not to contaminate the needle or puncture yourself.
 - Insert the needle straight in and inject the glucagon by pushing down on the plunger.
 - Withdraw the needle and massage the injection site.
- Injection is usually given intramuscularly. It may also be given subcutaneously; however, the absorption is slower.*
6. If a student awakens and is able to swallow, give sips of a clear lemon-lime soda pop or other sugar containing soda pop equaling 3 to 6 ounces (90 to 180 ml).
- Nausea and vomiting may occur as side effects of glucagon or extreme hypoglycemia. Juices may aggravate nausea. Providing a clear lemon-lime soda pop or other sugar containing soda pop is preferred.*
7. Assist paramedics as needed.
8. Record the procedure on the student health record.⁶

Glucagon Injection Skills Checklist

Student's Name: _____

Person Trained: _____

Position: _____

Instructor: _____

	Demo Date	Return Demonstration					
		Date	Date	Date	Date	Date	Date
A. States name and purpose of procedure							
B. Preparation:							
1. Sends for help							
2. Reviews procedure							
3. Positions for student safety							
4. Identifies possible problems & appropriate actions							
C. Identifies Supplies:							
1. Instant glucose							
2. Soap and water							
3. Skin prep. & blotting material							
4. Glucagon syringe & vial							
5. Sugar containing soda pop							
6. Sharps container							
D. Procedure:							
1. Washes hands							
2. Assembles equipment							
3. Explains procedure to student & encourages participation if possible							
4. Positions student on side							
5. Squeezes instant glucose between cheek & gum & massages area							
6. Prepares glucagon injection							
7. Cleanses injection site							
8. Administers injection then massages injection site							
9. Safely disposes of needle							
10. Gives sips of sugar containing pop to the conscious student (who is able to swallow)							
11. Assists paramedics as needed							
12. Documents procedure and problems							
13. Reports to lawful custodian							

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Checklist content reviewed by:

Parent/Lawful Custodian

Date

Information on pages 1- 4 of this section adapted from:

Graff, J., Ault, Guess, D., Taylor, M., and Thompson, B. (1990). "Glucose Monitoring." *Health care for students with disabilities: An illustrated medical guide for the classroom.* (pp. 185-196). Baltimore: Paul H Brookes Publishing Company.

California Department of Education. (1990). "Diabetes." *Guidelines and procedures for meeting the specialized physical health care needs of pupils.*

American Diabetes Association (1997). "Diabetes Care". *Clinical practice recommendations.* 20. (Suppl. 1).

2. Information on pages 5-12 of this section adapted from:

Keen, T., et. al. (1996) *Guidelines for specialized healthcare procedures.* Virginia Department of Health. (pp. V18-V35). Richmond.

3. Children's Hospital Chronic Illness Program, Ventilator Assisted Care Program. (1987). *Getting it started and keeping it going: A guide for respiratory home care of the ventilator assisted individual.* New Orleans, LA. Adapted by permission.

Information on pages 14-17 of this section adapted from:

Keen, T., et. al. (pp. V32-V34).

5. Children's Hospital Chronic Illness Program, Ventilator Assisted Care Program.

6. Information on pages 19-22 of this section adapted from:

Keen, T., et. al. (pp. V30-V31).

7. Children's Hospital Chronic Illness Program, Ventilator Assisted Care Program.